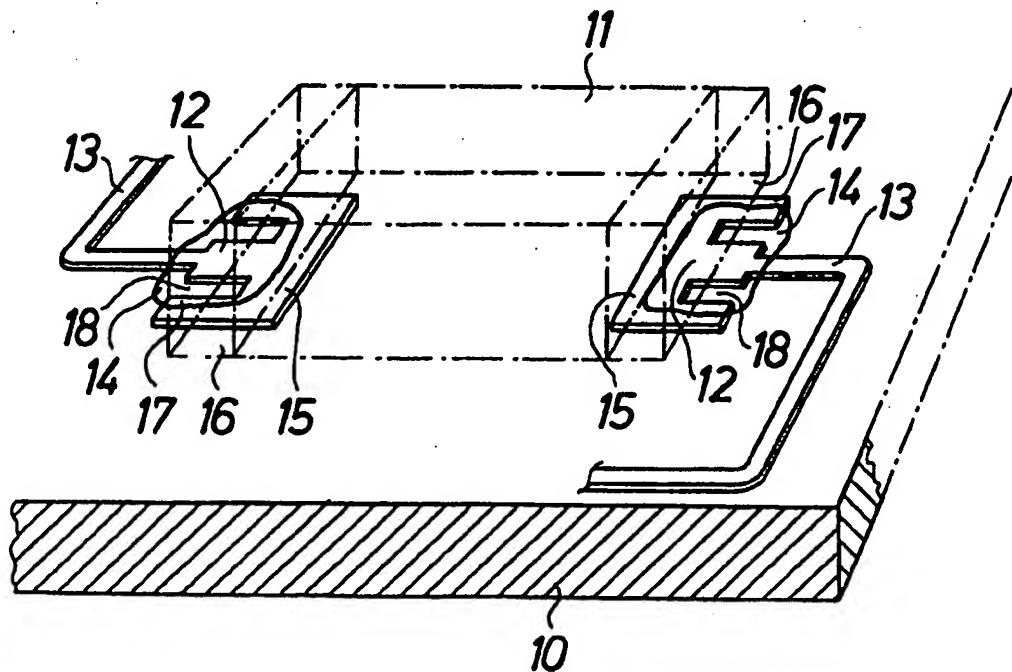


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(54) Title: A CIRCUIT BOARD WITH SPECIFICALLY DESIGNED CONNECTION TERMINALS



(57) Abstract

A circuit board (10) with spaced circuits (13) and connection terminals (12) of metal for connection of electrical components (11) between the connection terminals by means of electrically conductive glue (14), which connects the connection terminals (12) and the components (11) electrically and mechanically. The connection terminals (12) are designed in pairs with substantially continuous fronts (15) facing each other with a space (18), which is delimited behind the front (15) and is free from circuits (13) and connection terminals (12), for receiving and adhesion of the glue (14).

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A CIRCUIT BOARD WITH SPECIFICALLY DESIGNED CONNECTION TERMINALS

5 Technical Field

The most frequently used method today of producing electrical circuits is to arrange circuit patterns of metal on a card or board of isolating material, usually a plastic material. Connection terminals are provided in the circuit 10 pattern and are electrically connected with metallized contact surfaces of electrical components, so that the desired electrical function is obtained.

Technical Background

In order to obtain the electrical connection, solder 15 of varying metal composition with a larger or lesser amount of lead is usually utilized. At surface mounting of the electrical components a mechanical connection between the connection terminal and the contact surfaces of the component is also established by means of the solder. The solder 20 provides good mechanical strength, as contact surfaces as well as connection terminals are made of metal.

The connection terminals are usually rectangular plates, which are shaped in accordance with the circuit pattern. Circular connection terminals can also be found.

25 It has become common to replace the solder by electrically conductive glue. Such glues have considerable advantages with regard to environmental conditions, above all because lead is obviated. Electrically conductive glues also fit well into a development of the present soldering 30 technique in order to obtain a better quality in the electronic industry.

Most available glues have satisfactory electrical qualities and have good adhesiveness to the board of plastic. However, the glue acts differently at the application 35 in comparison with the solder, and a problem which has appeared is that glue flows in under the surface mounting

component. The component may herewith be short-circuited, so that the desired electrical function of the circuit is not obtained.

The Invention

5 An object with the present invention is to substantially obviate the above mentioned problems and to bring about a short-circuit free connection between the connection terminals of the circuit board by means of electrically conductive glue. The connection shall also be mechanically stable.

10 These objects are fulfilled in that the connection terminals are given such a form that glue is prevented from flowing from the connection terminal and spreading out under the surface mounting component, which is arranged between two adjacent connection terminals. The glue is instead allowed to flow in the opposite direction and spread out over the board, where the glue gets proper adhesion.

Short Description of the Drawings

15 The invention will be further described below under reference to the attached drawings, in which Fig 1 is a diagrammatic perspective view of a portion of a circuit board with connection terminals according to the invention and Figs 2 - 6 are diagrammatic plan views of alternative shapes for the connection terminals according to the invention, the left hand part of respective figure showing connection terminals without a component and the right hand part with a schematically shown component.

Detailed Description of Preferred Embodiments

20 Fig 1 shows a conventional circuit board 10. In a conventional way the circuit board 10 is provided with circuits 13 of metal in a desired pattern. The circuits 13 are ended with connection terminals 12 according to the invention where electrical components shall be connected with the circuits in order for the desired circuit function to

be obtained. In the shown example an electrical component 11 has been arranged between two connection terminals 12. In its ends the electrical component 11 is provided with metallized contact surfaces 16, which are electrically and 5 mechanically connected with the connection terminals 12 by means of an electrically conductive glue 14.

Preferably the glue 14 is applied to the circuit board 10 on desired portions on beforehand by any suitable method, for example screen printing, coating, spraying etc. 10 At the application of the glue 14 and/or when the glue is influenced, so that it flows in connection with the application of the component 11, the glue 14 shall be prevented from flowing in under the component and cause short circuiting and other malfunctions. This is according to the invention attained in that connection terminals 12, which are to be connected in pairs with each other by means of the component 11, are designed with continuous fronts 15 in its portions facing each other. The thickness of the connection terminals 12 and the circuits 13 is slightly exaggerated in 15 Fig 1, but the elevation from the circuit board provided by the connection terminal 12 with the front 15 will guide the glue 14 in the direction away from the component 11. In the preferred embodiment according to Fig 1 the connection terminals 12 are further designed with side members 17, which 20 are perpendicular to the front 15 and which prevent the glue 14 from flowing out sideways. There are free surfaces 25 18 of the circuit board 10 between the side members 17 and the front 15, against which the glue 14 strongly adheres.

Depending on the circumstances and the actual use, 30 the contact surfaces 16 of the electrical components 11 can lie directly against the connection terminals 12 or be separated therefrom by means of a layer of glue 14.

Figs 2 - 6 show alternative embodiments of connection terminals 12, which have properties directly corresponding 35 to the connection terminals shown in Fig 1. In the embodi-

ment according to Fig 5 side members 17 are lacking, which makes this embodiment less suitable in cases with several connection terminals arranged beside each other. Fig 6 shows an embodiment with a component having several contact surfaces. In such uses the connection terminals are grouped for conformity to the position for and the number of contact surfaces of the component.

The form and dimensions of the connection terminals 12 can be varied in many ways within the scope of the invention. Different materials can also be used for the circuit board, the circuits and the connection terminals. Electrically conductive glues of conventional kind are preferably used, but also anisotropic glues, i e glues conductive in only one direction, can be used in certain applications.

CLAIMS

1. A circuit board (10) with spaced circuits (13) and connection terminals (12) of metal for connection of electrical components (11) between the connection terminals by means of electrically conductive glue (14), which connects the connection terminals (12) and the components (11) electrically and mechanically, characterized in that the connection terminals (12) are designed in pairs with substantially continuous fronts (15) facing each other and in that a space (18), which is delimited behind each front (15) and is free from circuits (13) and connection terminals (12), is intended for receiving and adhering of the glue (14).
2. A circuit board according to claim 1, characterized in that the connection terminals (12) are designed with side members (17) extending from the fronts (15) for sideways delimiting the space (18).
3. A circuit board according to claim 1, characterized in that the connection terminals have the shape of an E.
4. A circuit board according to claim 1, characterized in that the connection terminals are arrow shaped.

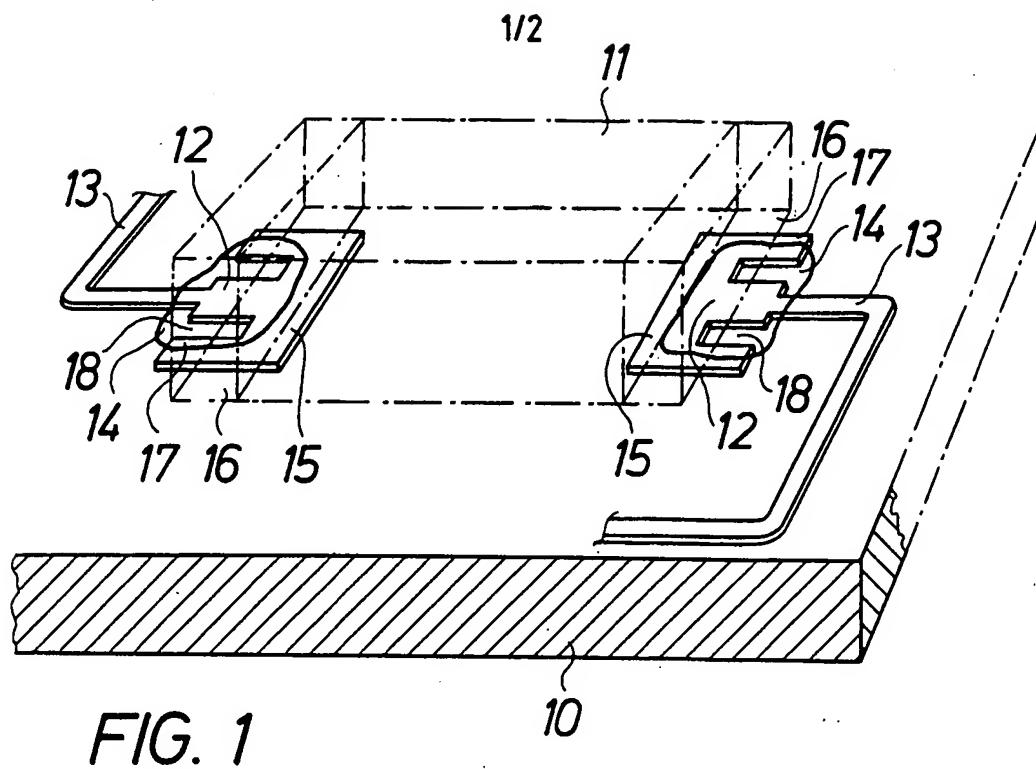


FIG. 1

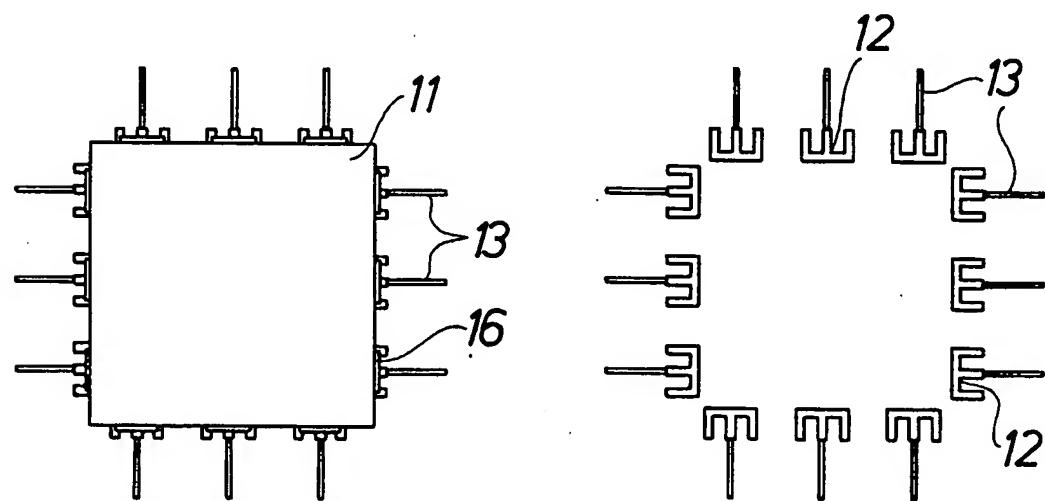


FIG. 2

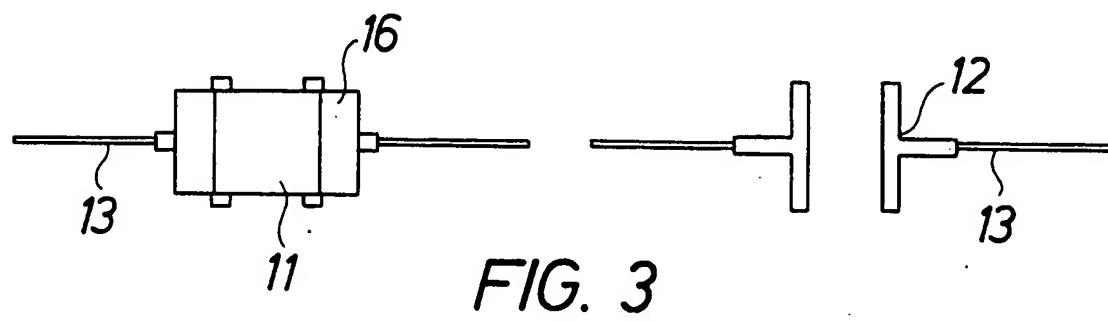


FIG. 3

2/2

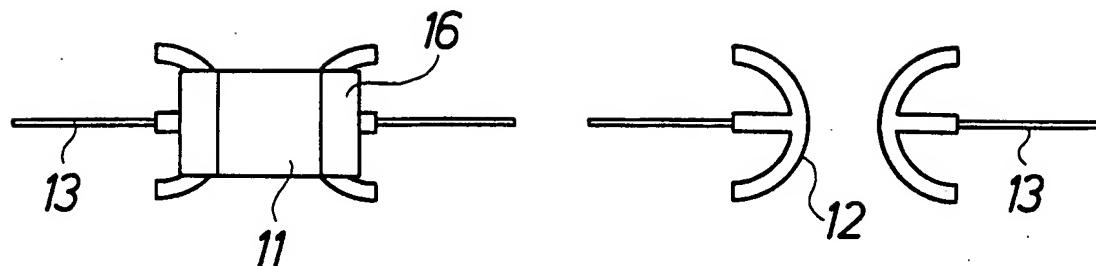


FIG. 4

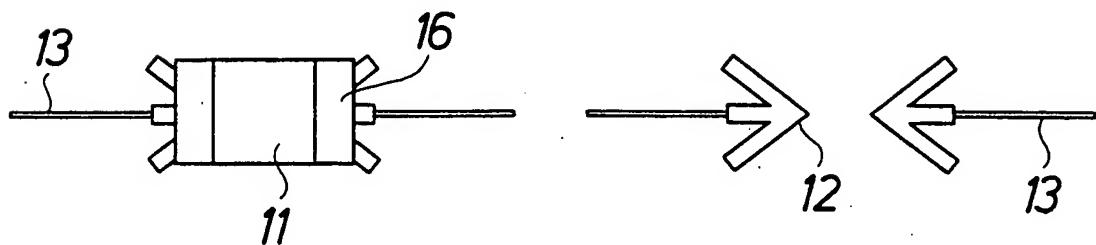


FIG. 5

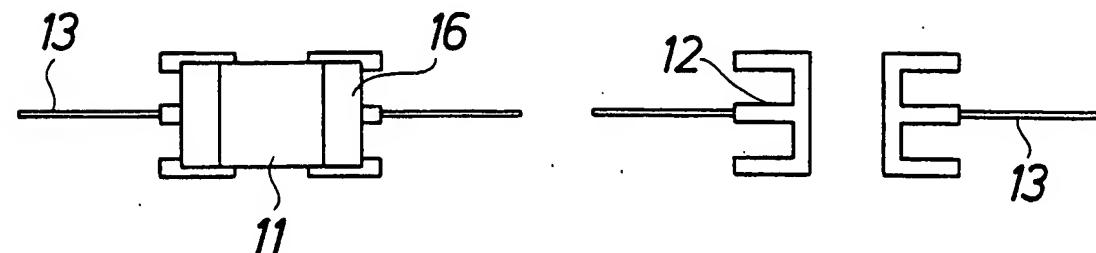


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 95/00019

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H05K 3/32 // H05K 3/34

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H05K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DIALOG: WPI, CLAIMS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>Elektroniktidningen, Volume -, No 16, October 1993, (Sweden), Per Henricsson, "Snart är problemen med limmade komponenter lösta", page 19 - page 20, see whole article</p> <p>---</p> <p>-----</p>	1

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